

bands; belly white, throat brown. From snout to vent 63 millim.

Buenos Ayres.

Described from one of the type specimens (♀) in the Paris Museum, kindly communicated by Prof. Vaillant.

XXXVII.—*Notes from the St. Andrews Marine Laboratory (under the Fishery Board for Scotland).*—No. VIII. By Prof. M'INTOSH, M.D., LL.D., F.R.S., &c.

1. On a Post-larval *Labrus*, with Remarks on the Colour of Pelvic Fins.
2. On the Post-larval Condition of *Liparis Montagu*.
3. On a peculiar Teleostean Yolk-sac.
4. General Remarks on Post-larval Food-Fishes.

1. *On a Post-larval Labrus, with Remarks on the Colour of Pelvic Fins.*

While lately (middle of September) using the large mid-water net, which has proved so valuable in regard to the life-histories of marine forms, a young wrasse, about 11 millim. in length, was captured, which, from the length of the anal fin and other characters approaches *Labrus mixtus*, but appears to be only a post-larval example of *Labrus maculatus*, though further examination is necessary on this point.

This young wrasse shows boldly marked white touches on a greenish ground variegated with brown pigment. The general hue, indeed, is greenish brown with various bands and patches. Thus the head has two white touches (each somewhat crescentic in form) over the brain, and a transverse one in front of the dorsal fin. A brown band passes from the middle of the eye forward on the snout and in line with the brown bar on the tip of the mandible. Another brown bar extends from the eye downward and forward, a third touch occurs on the hyoid, and two or three bars exist elsewhere on the head. The eyes are pale greenish with golden arches superiorly, and a band of brownish red surrounds the pupil, except inferiorly, where it is almost absent. This reddish belt has a process anteriorly and posteriorly.

The body is conspicuously marked with eight white spots, the first being near the pectorals, the last in the centre of the base of the tail. These spots are situated above the lateral line. Five opaque white spots again occur above the former, two sending prolongations to the tip of the dorsal fin, and a

third partially. Four specks of white are placed along the ventral margin, two lying in the basal line of the anal fin. A few minute specks occupy the space between the latter and the larger upper series. Large silvery patches, again, extend from beneath the eye to the end of the abdomen. A few brown specks appear on the ventral surface in front of the pelvic fins, and two boldly marked brown touches lie in the median line between the latter and the anus.

Besides the white touches which enliven the dorsal fin an opaque brownish one occurs in front. The soft rays of this fin have not yet attained the proportionally elongated condition of the adult organ. The pectorals are large and somewhat transparent, their very rapid vibratory movement resembling that of *Hippocampus* and the Syngnathidæ. A brown bar, however, marks their fleshy basal region, which in these and many other post-larval fishes is much larger in proportion than in the adult—a condition probably connected with increased functional activity. The ventral fins are opaque white, with a brownish belt in front (anterior rays); this belt, moreover, joining a brown band which proceeds upward to the base of the pectorals, where it bends nearly at a right angle straight backward to the posterior part of the abdominal wall. The anal fin has a brown patch (covering two rays) in front. None of the blue, yellow, or orange, so common in the adult, had yet appeared.

After immersion in spirit only the dark pigment remains, and thus the body has a peculiarly blotched or speckled appearance posteriorly, while the head and abdomen are striped.

The colour of the ventral fins in the post-larval forms of diverse families of fishes is apparently a feature of moment. Thus the post-larval *Motella* has its enormous white ventrals tipped with black, as Alex. Agassiz clearly describes and figures. The young cod, haddock, and whiting have pure white ventrals terminated by a long whip-like process at the end of the second anterior (or outer) ray. The great ventrals of the post-larval ling are conspicuously tinted of an ochre-yellow. The colour of the huge ventrals of the fishing-frog is not mentioned by Günther or Agassiz, but it is not unlikely that the post-larval pigment in this form also is peculiar. The pelagic habits of many fishes at this stage are probably associated with these peculiar tints, just as both sides of most post-larval Pleuronectidæ are tinted for a time, as the ventral surface of the large abdomen of *Callionymus* at this stage is of a dusky blackish hue, and as the abdomen in certain post-larval *Cotti* is furnished with a broad and conspicuous belt of black.

It is interesting that rock-frequenting species, like the present form, *Cyclopterus*, and others, should display such vivid tints both in the post-larval and occasionally in the adult condition.

### 2. *On the Post-larval Condition of Liparis Montagui.*

In former notes\* mention has been made of the ova and larval condition of this species. The chief peculiarities of the post-larval form, about 10 millim. in length, may now be indicated. In this specimen the notochord still projects superiorly from the tip of the tail, and the hypural edge is almost vertical. The caudal region with its fin-rays is bluntly conical.

A marked feature is the elevation of the first region of the dorsal fin and its wider rays, a differentiation perhaps indicating the relationship with a form in which such is present in the adult, or marking the region which in others becomes the first dorsal. This elevation disappears in the adult. The head and cheeks have a few black specks, and these also occur on the anterior region of the body. The pectorals are speckled in a similar manner. The elongated rays of these fins are not yet developed, so that this is a subsequent character; their margins trend evenly from the anterior part of the sucker backwards and upwards.

The difference in regard to the size of the eye of such a species as this and one of the post-larval Gadoids is marked, the large eyes of the latter being diagnostic, and probably associated with their greater adroitness and rapidity in catching minute prey.

### 3. *On a peculiar Teleostean Yolk-sac.*

One of the most interesting larval fishes of this season (1887) at the Laboratory was an unknown form (though there are some grounds for associating it with the gunnel), distinguished amongst all others with which we are at present acquainted by the remarkable peculiarity of the presence of a large portion of the liver in the yolk-sac. A full description, with figures, of this elongated and very hardy species will be given by Mr. Prince and myself in the "Researches" from the Laboratory; but it may be mentioned that the yolk-sac is directed downwards and forwards from the body of the fish, and is slightly opaque, while the oil-globule is of crystalline translucency and furnished with a thick protoplasmic investment. Though the globule is near the inferior border of the sac, yet it is close to the heart, from the shortness of the sac. The liver proceeds downwards on the left side, and extends

\* Ann. & Mag. Nat. Hist. June 1885, and Reports to the Fishery Board for Scotland, 1885 and 1886.

posteriorly to the fundus of the sac, its tissue insinuating itself between the yolk and its proper covering and the yolk-sac. The rounded gall-bladder lies at the posterior and upper region of the latter, and after the absorption of most of the yolk and the consequent forward displacement of the oil-globule this large sac remained very conspicuous. The alimentary canal in the advanced forms presents two marked constrictions, one behind the gall-bladder and another a little in front of the anus, which occurs near the middle of the body, a feature, after absorption of the yolk-sac, that at once distinguishes them from the larval herring, in which the anus lies very far back. The conspicuous gall-bladder is also diagnostic when compared with the larval sand-eel, in which the anus is likewise more or less median in position.

#### 4. *General Remarks on Post-larval Food-Fishes.*

There seems to be a community in habit amongst the post-larval Gadoids, especially, so far as present knowledge goes, in the case of the cod and whiting, though probably also in the haddock, just as there is a community in regard to their ova. In the early post-larval stages of the cod and whiting close resemblances exist, especially after preservation in spirit, but they are easily discriminated after reaching the length of about five eighths of an inch. They roam throughout the deeper parts of the neighbouring sea, but are not confined thereto, some being occasionally found in the upper regions and some in the shallow water (4-5 fathoms). They are met with, however, in greatest numbers in the regions near the bottom in their post-larval stages.

It is doubtful if the migrations described by Prof. G. O. Sars in the case of the cod can, in the light of present facts, be accepted as the rule in this or in allied species. The floating eggs are carried (if they are not already there) into shallow as well as into deep water, and thus the post-larval fishes are common in both regions. Most, however, probably occur on or near the grounds frequented by the adults, and hence it is that far from shore young post-larval forms are even more numerous than in shallow or other water near land. The same applies to certain flat fishes, such as the witch (*Pleuronectes cynoglossus*), the young of which keep near the ground frequented by the adult and do not migrate to any extent into other regions.

The older post-larval forms of the cod and its allies, as already described, seek in the various bays the margin of the rocks in search of the abundant food there; but it is not proved that there is any general migration from deep to shallow

water, as Prof. Sars thinks. Similar forms occur in deep water and in the neighbourhood of isolated rocks, such as the Bell Rock, and especially on the grounds frequented by the adult.

XXXVIII.--*A new Species of Zygæna from the Kurrachee Harbour.* By JAMES A. MURRAY, Vict. Nat. Hist. Inst.\*

*Zygæna dissimilis*, sp. nov.

(Ex Journ. Bomb. Nat. Hist. Soc.)

Anterior edge of head sinuately curved. *No groove running along it.* Length of the hammer from eye to eye 26 inches; from the middle 13 inches. Each of its hind lateral expansions 10 inches; its width near the eye 6·5 inches, or less than the length. Eye situated at the upper third of the external edge of the lobe of the head, and 2 inches below the outer edge of the nostril. Teeth very slightly oblique, as broad at base as long, with an indistinct notch laterally and serrated on both edges to near the tip. They are convex before and behind, with an oblong nodose prominence mesially at the base on the outer surface. The 1st dorsal arises from a little more than an inch inside the extreme hind edge of the pectoral fin; it is falcate in shape and measures along the curve to tip 25 inches; the greatest width to hind prolongation at the base 15·75 inches. Pectoral fin 18 × 12 inches, or one third longer than broad. Second dorsal arises from opposite the anal; it is triangularly concave behind, and not straight as depicted in the plates of *Zygæna malleus*, *Blochi*, and *Tudes* in Day's Fishes of India, and it has also an elongated process at base. Ventral fin 11 × 10·5 inches, also triangularly concave behind, and not straight as in the other species. Anal fin 7 × 11 inches, concave behind, the distance from its insertion to the tip of the elongate process of the ventral 5 inches. A pit at the root of the caudal; upper caudal lobe falcate, lower proportionally longer than in the other species. Colours brownish grey throughout, except a width of 10 inches on the under surface, and the under surface of the hammer, where it is white.

The following are the measurements of this species taken in the flesh:—

\* From the 'Indian Annals and Magazine of Natural Science,' June 1887, pp. 90-92.